U.S. DEPARTMENT OF
ENERGY

Office of
Electricity Delivery
& Energy Reliability

# *Support for State Energy Policy Decision-Makers*

## *…Technical Assistance and More*

Caitlin Callaghan

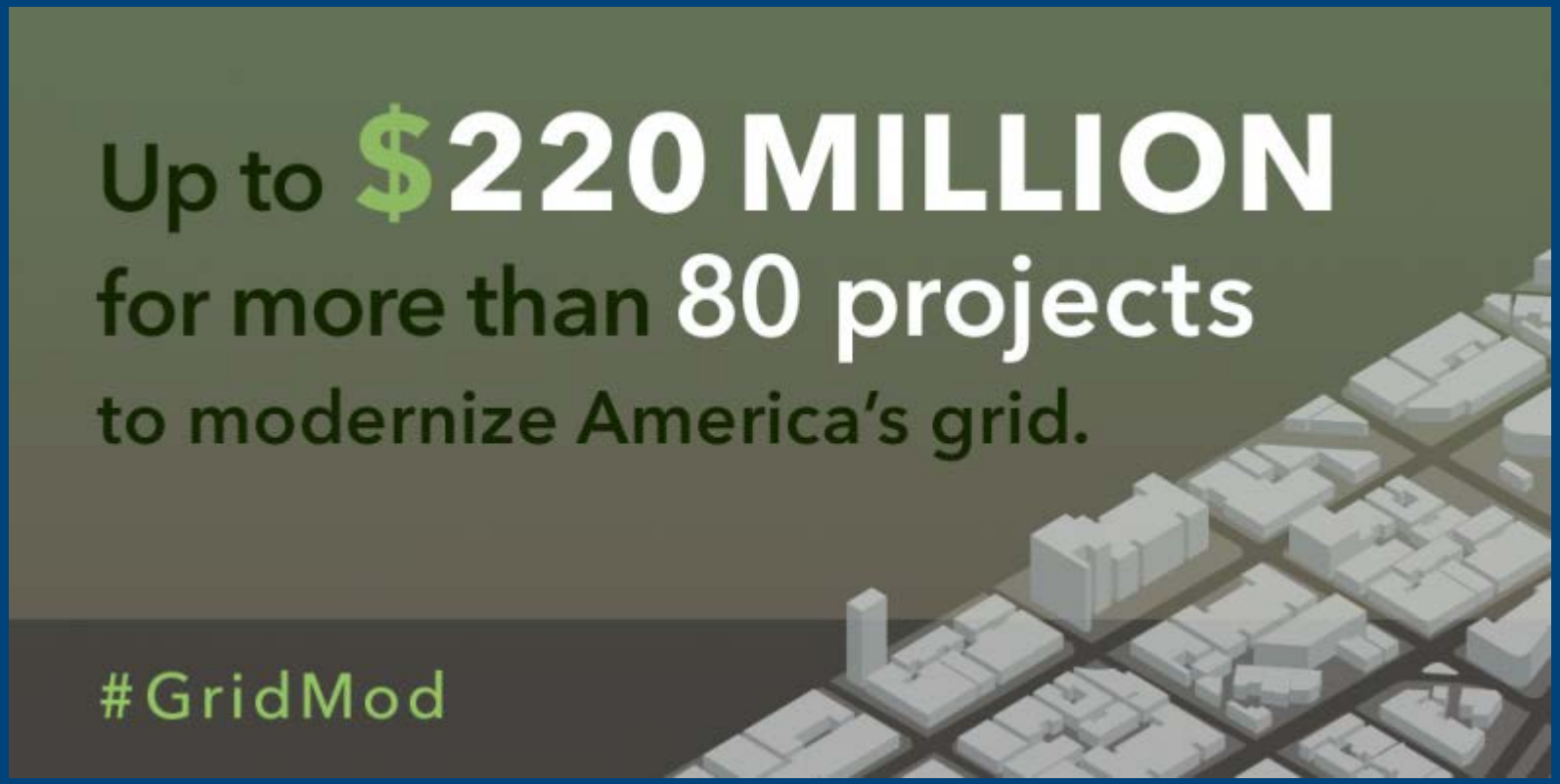
Transmission Permitting and Technical Assistance Division

July 26, 2017 – NASEO National Energy Policy Program and Institute

# DOE Acronyms/Abbreviations

| | |
|---|---|
| OE | Office of Electricity Delivery and Energy Reliability |
| QER | Quadrennial Energy Review |
| GMI | Grid Modernization Initiative |
| GMLC | Grid Modernization Laboratory Consortium |
| GridMod | Grid Modernization |
| QTR | Quadrennial Technology Review |
| MYPP | Multi-Year Program Plan |
| DER | Distributed Energy Resources |
| EPTA | Electricity Policy Technical Assistance (Program) |
| TA | Technical Assistance |
| EEAC | Energy Emergency Assurance Coordinators |
| NARUC | National Association of Regulatory Utility Commissioners |
| NASEO | National Association of State Energy Officials |
| NCSL | National Conference of State Legislatures |
| NASUCA | National Association of State Utility Consumer Advocates |
| TTX | Table Top Exercise |

# DOE's Grid Modernization Initiative & Grid Modernization Laboratory Consortium



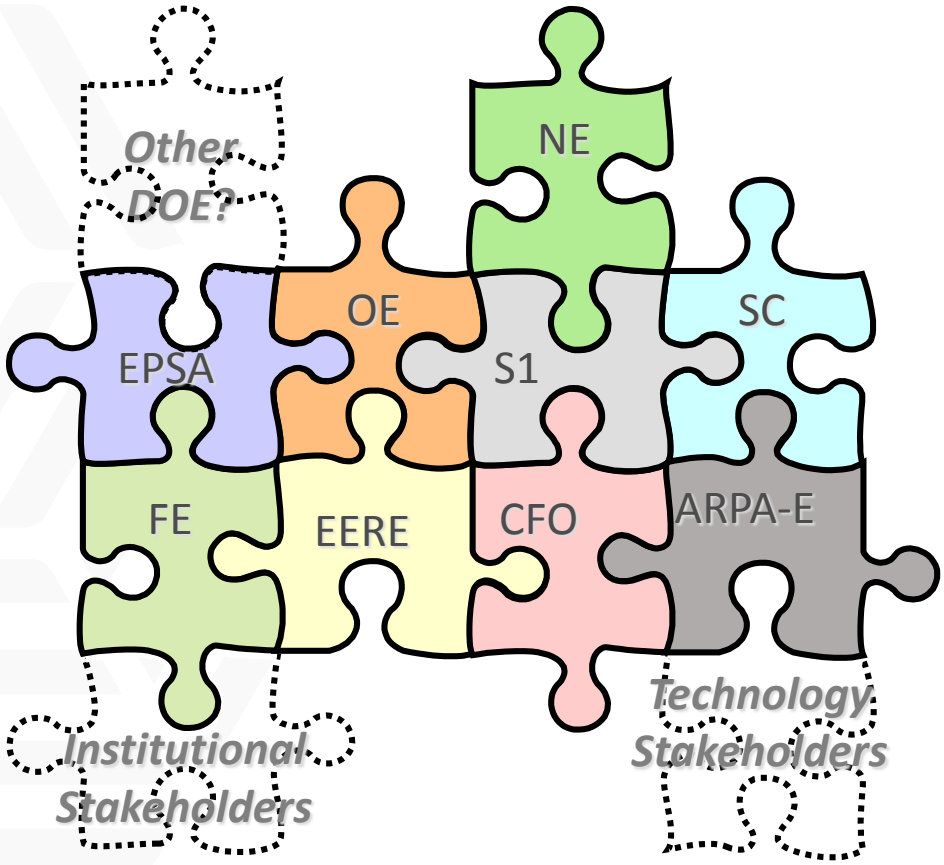

http://energy.gov/articles/doe-announces-220-million-grid-modernization-funding

# Grid Modernization Initiative

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

**An aggressive and urgent five-year grid modernization strategy for the Department of Energy that includes**

- **Alignment of the existing base activities among the Offices**
- **An integrated Multi-Year Program Plan (MYPP)**
- **New activities to fill major gaps in existing base**
- **Development of a laboratory consortium with core scientific abilities and regional outreach**



# Grid Modernization Multiyear Program Plan

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy


- Devices and Integrated Systems
- Sensing and Measurement
- System Operations and Control
- Design and Planning Tools
- Security and Resilience
- Institutional Support

# MYPP Integrated Technical Thrusts

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

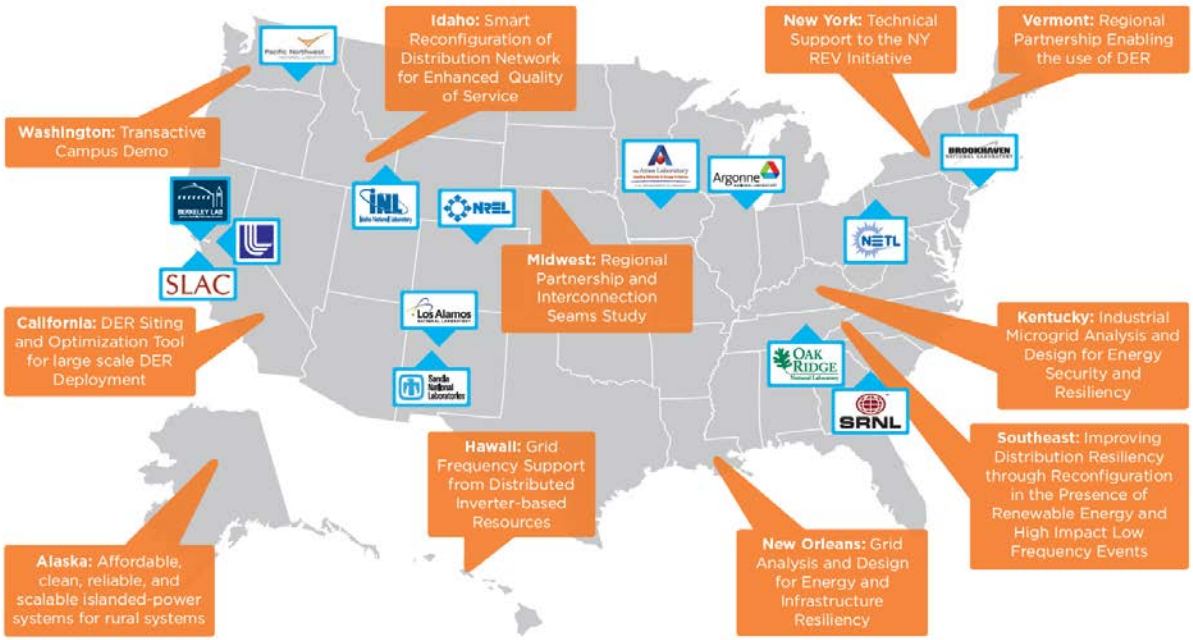
| | |
|---|---|
| Institutional Support | • Provide tools and data that enable more informed decisions and reduce risks on key issues that influence the future of the electric grid/power sector |
| Technology Innovation: Design and Planning Tools | • Create grid planning tools that integrate transmission and distribution and system dynamics over a variety of time and spatial scales |
| Technology Innovation: System Operations, Power Flow, and Control | • Design and implement a new grid architecture that coordinates and controls millions of devices and integrates with energy management systems |
| Technology Innovation: Sensing and Measurements | • Incorporates information and communications technologies and advances low-cost sensors, analytics, and visualizations that enable 100% observability |
| Technology Innovation: Devices and Integrated System Testing | • Develop new devices to increase grid services and utilization and validate high levels of DER at multiple scales |
| Technology Innovation: Security and Resilience | • Develop resilient and advanced security (cyber and physical) solutions and real-time incident response capabilities for emerging technologies and systems |

# Grid Modernization Lab Call

## Working across the country

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

- Grid Modernization Lab Call
  - $220M
  - 13 national laboratories
  - 88 projects
  - 100+ partners



# Grid Analysis and Design for Energy and Infrastructure Resiliency for New Orleans

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

**Research focus:** Supports NOLA's resilience goals by using advanced grid modeling design tools to develop cost-effective, grid resilience enhancements for NOLA and the surrounding region.

This project focuses on enhancing the resilience of the grid as part of the broader energy infrastructure.

### Key Activities

- Infrastructure impact modeling and analysis
- Design and integration study of grid modernization options
- Resilience cost/benefit analysis
- Transactive control feasibility
- Final report to inform resilience prioritization plan which includes microgrid territories (see image)

### Expected Benefits

- Better understanding of infrastructure and community resilience subject to grid performance in NOLA
- Set of risk-informed, cost-effective recommendations for grid enhancements that improve NOLA community resilience
- Conceptual designs utilized by NOLA, Entergy, and other cities to prioritize energy infrastructure improvement options


## Partners

- City of New Orleans
- Sewerage and Water Board of New Orleans
- Entergy New Orleans
- US Army Corps of Engineers
- 100 Resilient Cities

# Midwest Interconnection Seams Study

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

**Research focus:** Determine value of expanding the transfer capacity between the Eastern and Western Interconnections (EI and WI) under various configurations.


**Project Accomplishments**

- 2 in-person technical review committee meetings with 40 participants
- 4 scenarios selected for transmission and generation expansion, with assumptions and potential sensitivities identified
- Weather analysis completed; 4 TB of wind and solar data distribution
- Research timeline for modeling activities completed and approved; co-simulation method identified

**Next Steps**

- Conduct capacity expansion analysis
- Test production cost models
- Perform AC power flow and N-1 contingency analysis

*Three coordinated modeling tools will be used to calculate the value of expanding the interconnectivity of the interconnections: capacity expansion, production cost, and AC power flow.*

# Alaska Microgrid Partnership

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

**Research focus:** Investigate, develop, and analyze pathway for islanded microgrids, testing the pathway using two pilot projects, and create a repeatable process for other communities to follow.

**Key Activities**

- Design framework for standardized systems
- Technical paper describing diesel testing results
- Technical paper with assessment of storage options
- Provide technical and business case studies for two pilot communities

**Planned Outcomes**

- Document the full techno-economic development process for reducing imported fuel consumption by at least 50% in remote microgrids in Alaska
- Identify investible opportunities (i.e. the business case) to attract the funding needed to implement these types of projects on a wide scale
- Create an implementation methodology for other communities to follow by documenting and publicizing the community assessment, data collection, project analysis and development process
- Implement the methodology in two pilot communities to act as models to position the communities to seek private and public funding to implement project recommendations

**Alaska Partners**

•REAP (Renewable Energy Alaska Project)
•ACEP (Alaska Center for Energy & Power)
•IES (Intelligent Energy Systems)
•ISER (Institute for Social & Economic Research)

# Grid Modernization Initiative

***Related Links***

- DOE Grid Modernization Initiative: https://energy.gov/under-secretary-science-and-energy/grid-modernization-initiative
- GMLC Projects – DOE site: https://energy.gov/under-secretary-science-and-energy/grid-modernization-lab-consortium
- GMLC Projects – non-.gov site: https://gridmod.labworks.org/ (this one was new to me, but seems to provide a good assortment of info)
- GMLC Projects – Peer Review: https://energy.gov/oe/articles/peer-review-grid-modernization-initiative-projects-be-held-april-18-21

# Grid Modernization Initiative

*Up Next – Resilient Distribution Systems*

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

- New GMLC Lab Call: Resilient Distribution Systems
  - 4-5 awards with cost share and partners (e.g., utility, institutional partner, RTO/ISO, technology partners, academics)
  - 36 month period of performance
  - DOE anticipates finalizing project selections in Fall 2017

- Highlights:
  - Consider regional/national scale
  - Integrate six technical areas of the Grid Mod MYPP
  - Leverage previous GMLC projects (e.g., lessons learned from architecture, interoperability, valuation, sensing and measurement)
  - Apply GMLC metrics (from metrics analysis project)
  - Incorporate field validations
  - Address regulatory and policy options

*Stay tuned to the DOE GMI website for more information*

# Office of Electricity Delivery & Energy Reliability

**Our Mission**

OE drives electric grid modernization and resiliency in the energy infrastructure.

OE leads the Department of Energy's efforts to ensure a resilient, reliable, and flexible electricity system. OE accomplishes this mission through research, partnerships, facilitation, modeling and analytics, and emergency preparedness.

## Office of the Assistant Secretary

| Advanced Grid Research & Development (AG R&D) | Transmission Permitting & Technical Assistance (TPTA) | Cybersecurity & Emerging Threats Research & Development (CET R&D) | Infrastructure Security and Energy Restoration (ISER) |
|---|---|---|---|

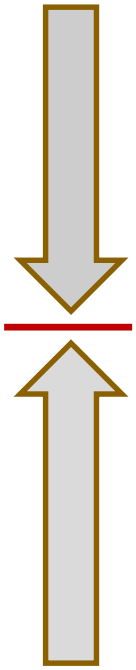
http://energy.gov/oe/about-us/our-organization

# Office of Electricity
## Energy Storage Program


**Dr. Imre Gyuk**
Energy Storage Program Manager
imre.gyuk@hq.doe.gov

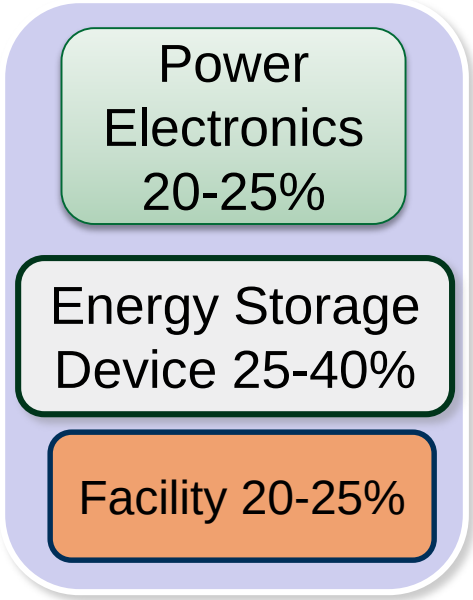
http://energy.gov/oe/services/technology-development/energy-storage

# Energy Storage Economics



The Cost of a Storage System depends on the Storage Device, the Power Electronics, and the Balance of Plant

The Value of a Storage System depends on Multiple Benefit Streams, both monetized and unmonetized




LCOE depends on Application!  Policy is important!

# Working with States & Localities

## Massachusetts - MA DOER Resilient Power Initiative

- **Microgrid/Storage Project** (Sterling, MA) – expands capacity of Police HQ and Dispatch Center to provide resiliency
- **Microgrid/Storage Project** (Northampton, MA) – leverages biomass, PV, diesel and energy storage to improve resilience on 3 abutting campuses (DPW, high school, hospital)
- **Flow Battery Projects** (Worcester and Everett, MA) – installation of battery containers; ARRA project

## Vermont – Public Service Department

- **Green Mountain Power** (Rutland, VT) – island-capable resilient microgrid installation installed on a brownfield area to serve a high school and emergency center

## Washington – State Clean Energy Fund

- **Flow Battery Projects** (WSU and UWA) – battery projects that will provide use case assessments and performance analysis

## Oregon – Eugene Water and Electric Board

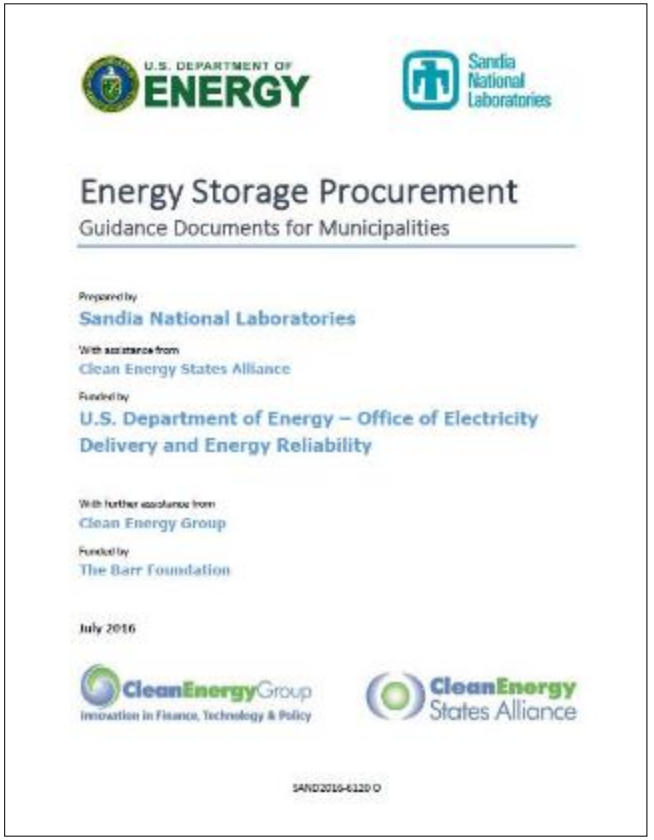
- **Grid Edge Demonstration Project** (Eugene, OR) – aggregation of energy storage with PV and diesel generation to provide grid services (e.g., peak shifting, transmission congestion relief, capacity/resource adequacy)

NEW RESOURCE

# Energy Storage Procurement, Guidance Document for Municipalities

This document was a response to requests from Massachusetts municipalities engaged in energy storage procurement, for assistance in drafting RFPs for equipment and services. It is now available for use by any entity procuring storage.

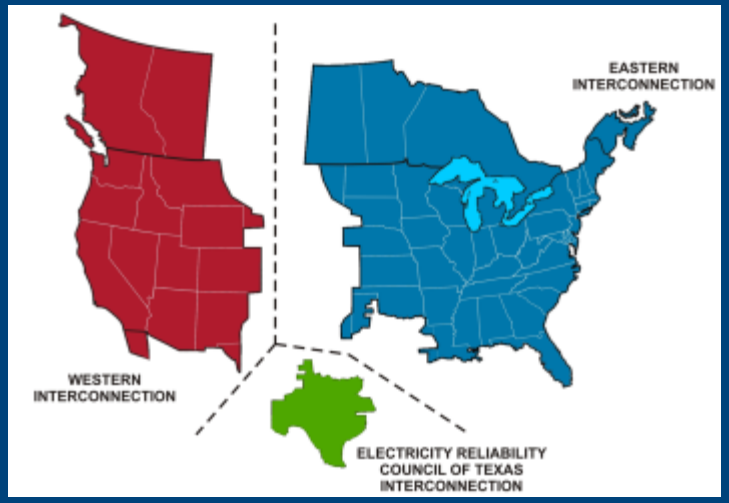
- Developed by Sandia National Laboratories
- Funded by DOE-OE
- Produced in partnership with CESA
- Contains two sample RFPs developed with Sterling, MA, plus a matrix of elements to include in an energy storage RFP




This document has generated a lot of interest, including from IEEE, which invited SNL to present on it at their PES GM Supersession on July 19 in Boston.

http://www.sandia.gov/ess/publications/SAND2016-6120.pdf

# Office of Electricity
## Transmission Permitting & Technical Assistance




# OE Electricity Policy Technical Assistance Program


[Utility Business Models](#)
[Ratepayer-Funded Energy Efficiency](#)
[Demand Response](#)
[Recovery Act Assistance](#)
[Uniform Methods Project](#)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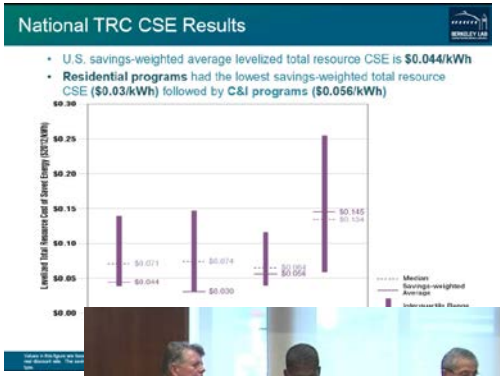
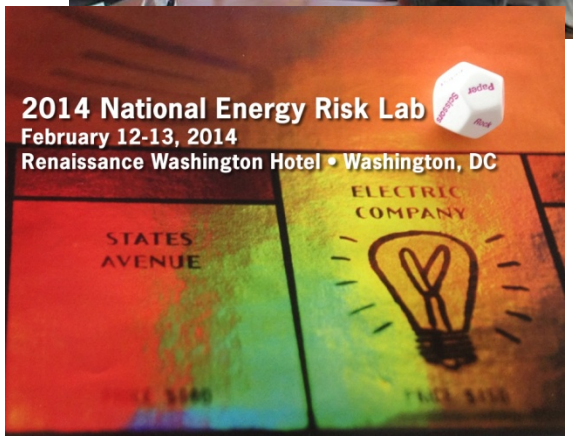
http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/electricity-policy-technical

# OE Electricity Policy Technical Assistance Program

## *Types of Assistance*




- **Analysis** assistance consisting of data collection and assessment activities to determine impacts and evaluate policy options and technology and market strategies
- **Stakeholder-Convened Discussions** by organizing task forces, working groups, and collaborative processes to tackle key issues and build consensus for preferred courses of action
- **Education and Training** through workshops and webinars to raise knowledge levels and better equip policy makers to address local and regional needs
- **Consultations** for quick-turnaround assignments involving technical experts advising policy makers on specific matters of interest

# How Eligible Entities and Organizations Get Assistance

*Program Execution*

## HOW TO GET ASSISTANCE

**TA generally provided in response to requests from eligible entities**

**Requests for assistance can be submitted**

- directly to the OE program contacts
- through a national laboratory
- through a national or regional organization

**TA is provided as appropriate and based on available resources**

- existing resources leveraged, if possible
- similar requests may be aggregated for economic/efficiency reasons
- other DOE program offices may be engaged to address relevant subject matter

## ELIGIBLE ENTITIES

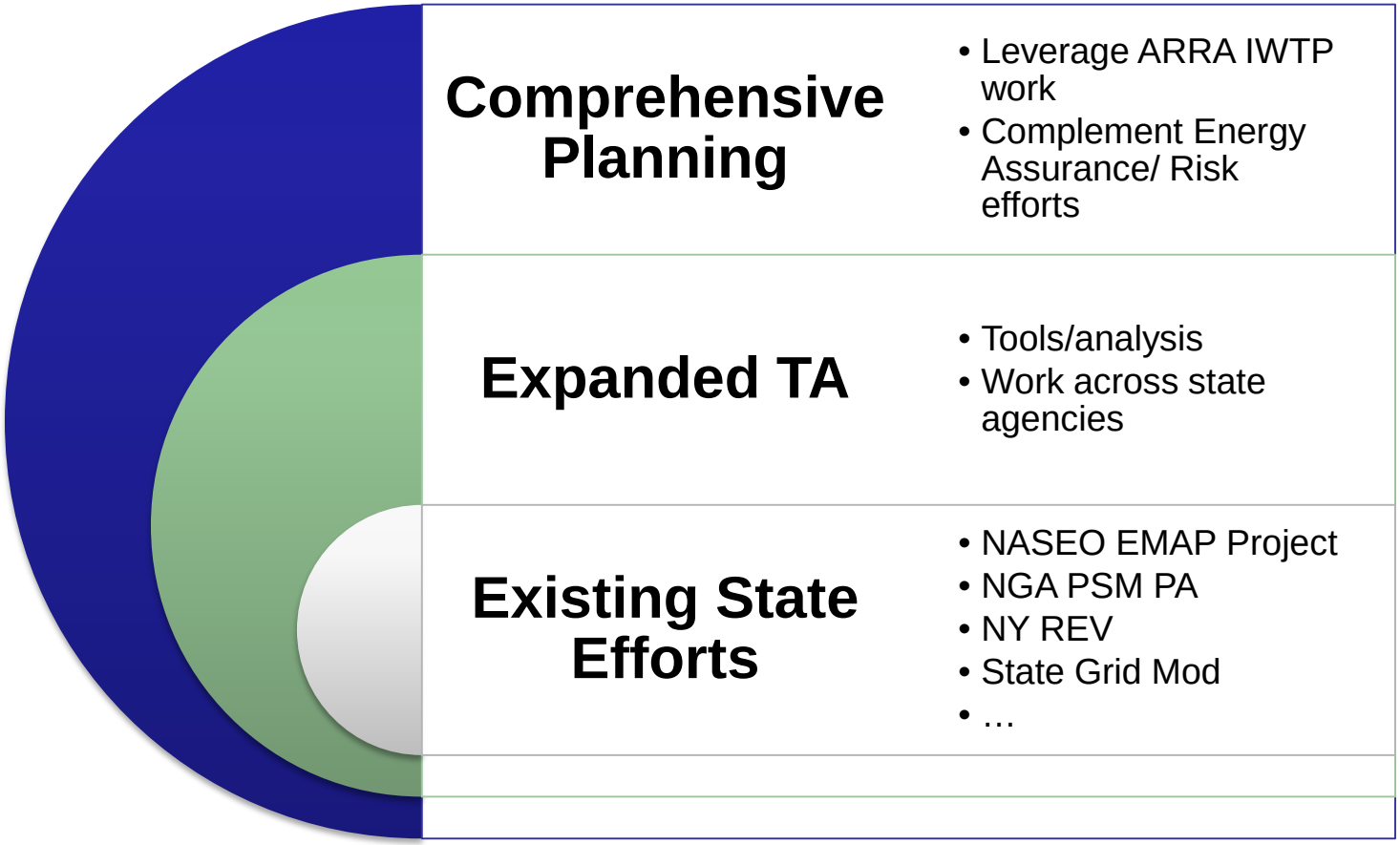
- State public utility commissions
- State legislatures
- National associations of state decision-makers
- Regional associations of state decision-makers
- Federal officials
- Governors' offices
- State energy offices
- Governing boards of public power and cooperative utilities

# Who are the experts?

*how/where they engage*

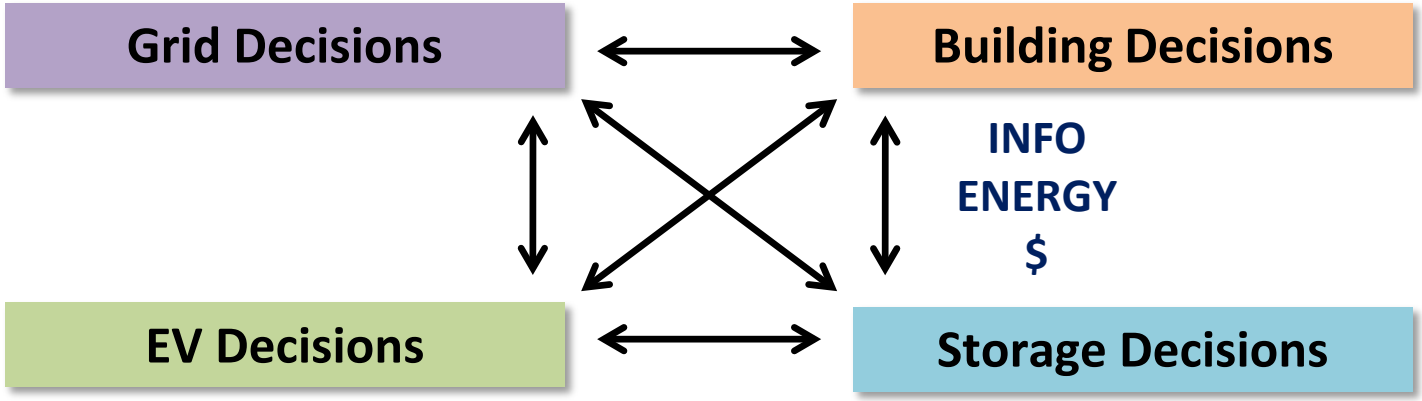
| Experts | Engagement |
|---|---|
| DOE staff | provide information about DOE programs/projects/initiatives relevant to TA request |
| National Labs | provide expert consultations, analytical support/guidance, develop tools/resources, provide training |
| Third-Party Experts (e.g., Regulatory Assistance Project, Clean Energy States Alliance) | provides expert consultation (e.g., NY REV), author issue papers/reports (e.g., Future Electric Utility Regulation series), inform identification of research areas/initiatives (LBNL advisory group) |
| N-group members | participate in document reviews, workshops and other discussions to develop resources (e.g., topical committees/ subcommittees) |
| Regional Groups (e.g., WGA, MGA, EISPC) | facilitate development of resources and tools (e.g., RAPID toolkit, Energy-Water Decision Support Tool, Energy Zones Mapping Tool) to inform state-based activities |

# Helping with Energy System Planning



# Resource Diversity, System Complexity

**The potential of high penetrations of mixed DERs presents an entirely new problem in control, coordination and value-determination within distribution systems**

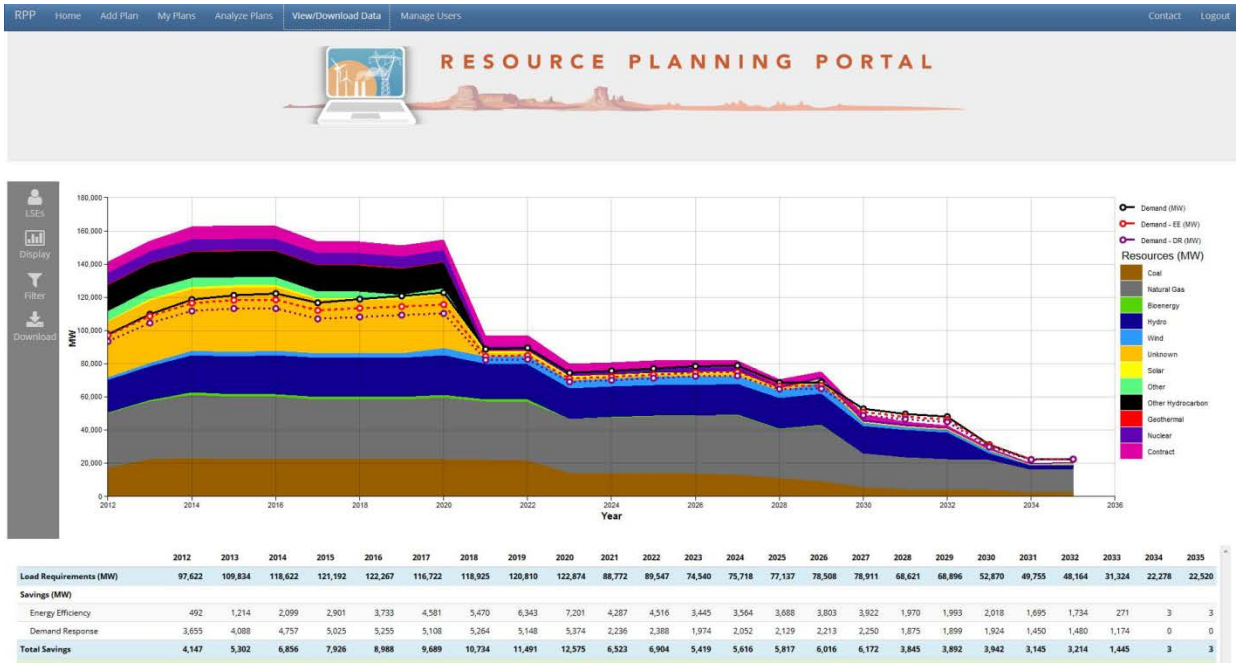



**Considerations:**

- **Structures: electric infrastructure, ICT, control, industry, regulatory**
- **Optimization: local & system, centralized & distributed control**
- **Convergence: grid/ICT/buildings/transportation/city infrastructure**
- **Markets: open access networks, platforms**

# Resource Planning Portal

## resourceplanning.lbl.gov




| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Load Requirements (MW)** | 97,622 | 109,834 | 118,622 | 121,192 | 122,267 | 116,722 | 118,925 | 120,810 | 122,874 | 88,772 | 89,547 | 74,540 | 75,718 | 77,137 | 78,508 | 78,911 | 68,621 | 68,896 | 52,870 | 49,755 | 48,164 | 31,324 | 22,278 | 22,520 |
| **Savings (MW)** | | | | | | | | | | | | | | | | | | | | | | | | |
| Energy Efficiency | 492 | 1,214 | 2,099 | 2,901 | 3,733 | 4,581 | 5,470 | 6,343 | 7,201 | 4,287 | 4,516 | 3,445 | 3,564 | 3,688 | 3,803 | 3,922 | 1,970 | 1,993 | 2,018 | 1,695 | 1,734 | 271 | 3 | 3 |
| Demand Response | 3,655 | 4,088 | 4,757 | 5,025 | 5,255 | 5,108 | 5,264 | 5,148 | 5,374 | 2,236 | 2,388 | 1,974 | 2,052 | 2,129 | 2,213 | 2,250 | 1,875 | 1,899 | 1,924 | 1,450 | 1,480 | 1,174 | 0 | 0 |
| **Total Savings** | 4,147 | 5,302 | 6,856 | 7,926 | 8,988 | 9,689 | 10,734 | 11,491 | 12,575 | 6,523 | 6,904 | 5,419 | 5,616 | 5,817 | 6,016 | 6,172 | 3,845 | 3,892 | 3,942 | 3,145 | 3,214 | 1,445 | 3 | 3 |

LBNL's Western Resource Planning Portal will help policymakers, planners, and other stakeholders evaluate regional planning activities and compliance across the WECC footprint.

The Resource Planning Portal currently contains long-term planning assumptions for ~40 load serving entities, which represent about 90%of total WECC delivered load.

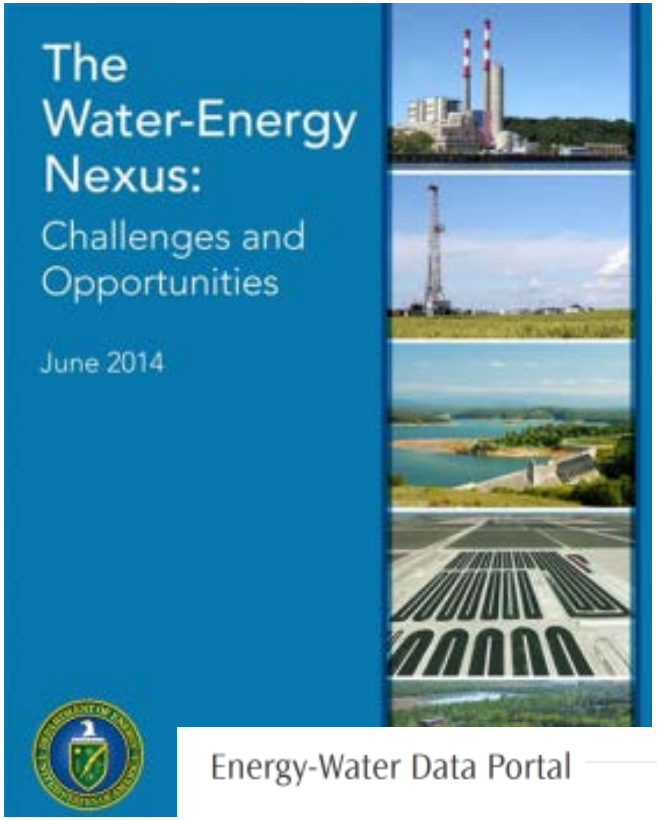
**The Resource Planning Portal is a web-based tool that allows users to:**

**Input electric utility planning information in a consistent format**

**Benchmark planning assumptions across jurisdictions**

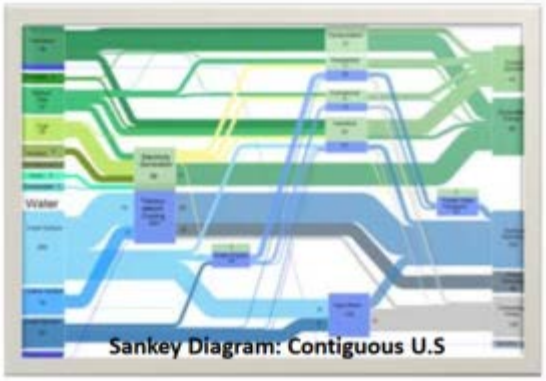
**Output results in a standardized format for deeper analysis.**

# Energy-Water Nexus
## *DOE and the National Labs*




## Sankey Diagrams

Useful accounting for Water-Energy Efforts



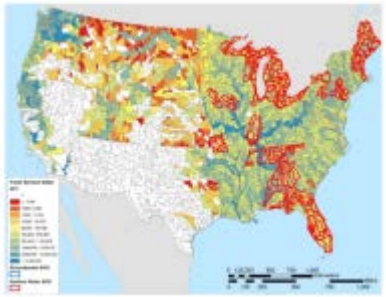

- Develop State based Sankey Diagrams
- Water Energy Nexus Team, NETL, and LLNL
- Improve and update data/inputs
- Address gaps in water and energy

6

## Energy-Water Data Portal

View and download energy and water data collected by this project. Data categories include:

- Thermoelectric water use,
- Water availability,
- Water cost,
- Other water use and supply data, and
- EcoRisk calculator.



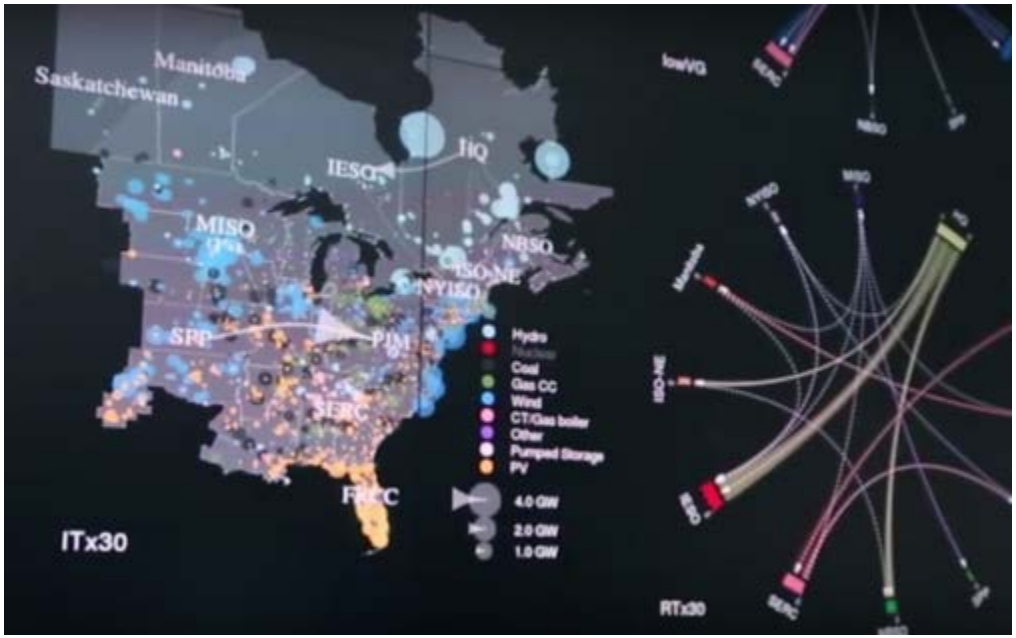
Sandia National Laboratories



U.S. DEPARTMENT OF ENERGY | Office of Electricity Delivery & Energy Reliability

# Eastern Renewable Generation Integration Study

## NREL Supercomputing Model Provides Insights from Higher Wind and Solar Generation in the Eastern Power Grid




- Data and analysis to help planners and regulators understand implications of higher wind and solar generation
- High-resolution model of the Eastern Interconnection, simulated at 5-minute intervals
- four hypothetical scenarios to analyze how the Eastern Interconnection might function in 2026, when the power system could have significantly less power generation from fossil fuels

**Key outcomes:**

- Complex model that solves in reduced time
- Insights into increased penetration of wind and solar
- New tools for understanding the system

**Disclaimers:** Model did not look at…

- capital costs, land use and siting, market design, gas pipeline, and other factors
- all aspects of reliability considered by system planners and operators, including system dynamics and AC power flow

**Visit: nrel.gov/ergis**



U.S. DEPARTMENT OF ENERGY | Office of Electricity Delivery & Energy Reliability

# Regulated Utility Business Models

## Future Electric Utility Regulation Series

A new series of reports from Lawrence Berkeley National Laboratory taps leading thinkers to grapple with complex regulatory issues for electricity.

The electric sector in the United States is seeing significant changes in technologies, customer desires, load growth, and federal and state policies and regulations. This new series of reports takes a unique point-counterpoint approach to highlight different views on the future of electric utility regulation and business models and achieving a reliable, affordable and flexible power system.

**8 Reports To Date**


https://emp.lbl.gov/projects/feur

**FINDER Model:** The **FIN**ancial impacts of **D**istributed **E**nergy **R**esources model quantifies changes in utility costs and revenues with the addition of demand-side and distributed energy resources (DERs)

https://emp.lbl.gov/finder-model

**Technical assistance** to state utility commissions and energy offices considering possible changes to regulations and policies to advance public interests in the electricity sector

https://emp.lbl.gov/projects/technical-assistance-states

# Future Electric Utility Regulation Report Series

**Reports published to date:**

1. Distributed Energy Resources (DERs), Industry Structure and Regulatory Responses
2. Distribution Systems in a High DER Future: Planning, Market Design, Operation and Oversight
3. Performance-Based Regulation in a High DER Future
4. Distribution System Pricing With DERs
5. Recovery of Utility Fixed Costs: Utility, Consumer, Environmental and Economist Perspectives
6. The Future of Electricity Resource Planning
7. The Future of Centrally-Organized Wholesale Electricity Market
8. Regulatory Incentives and Disincentives for Utility Investments in Grid Modernization

**Forthcoming report topics include:**

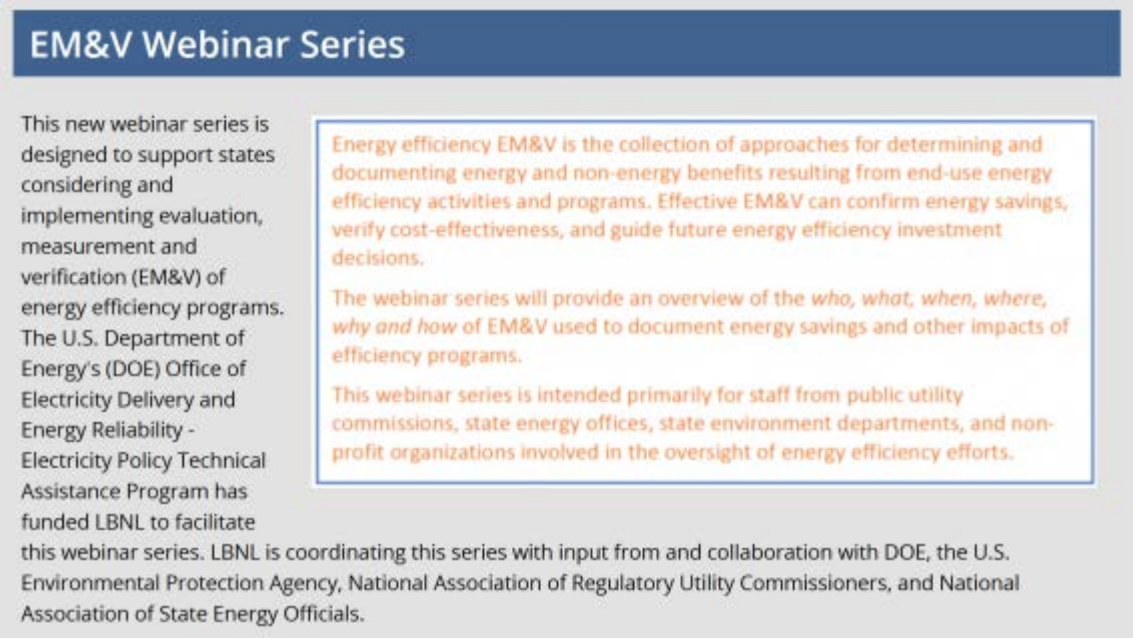
Value-Added Electricity Services: New Roles for Utilities and Third-Party Providers

# Evaluation Measurement & Verification Webinar Series

**The series will provide an overview of the *who, what, when, where, why and how* of EM&V used to document energy savings and other impacts of efficiency programs.**

**This webinar series is intended primarily for staff from public utility commissions, state energy offices, state environment departments, and non-profit organizations and offers an opportunity to engage with others in similar roles.**

https://emp.lbl.gov/emv-webinar-series




**<u>Upcoming Webinar</u>**
***Assessing the Cost-Effectiveness of Energy Efficiency Portfolios***
**Thursday, June 29, 2017**
**2:00-3:30 PM ET**

*New LBNL series funded by DOE's Office of Electricity Delivery and Energy Reliability Electricity Policy Technical Assistance Program, in collaboration with US EPA, NASEO, NARUC.*

# Modern Distribution Grid Planning

**Volume I. Customer and State Driven Functionality**

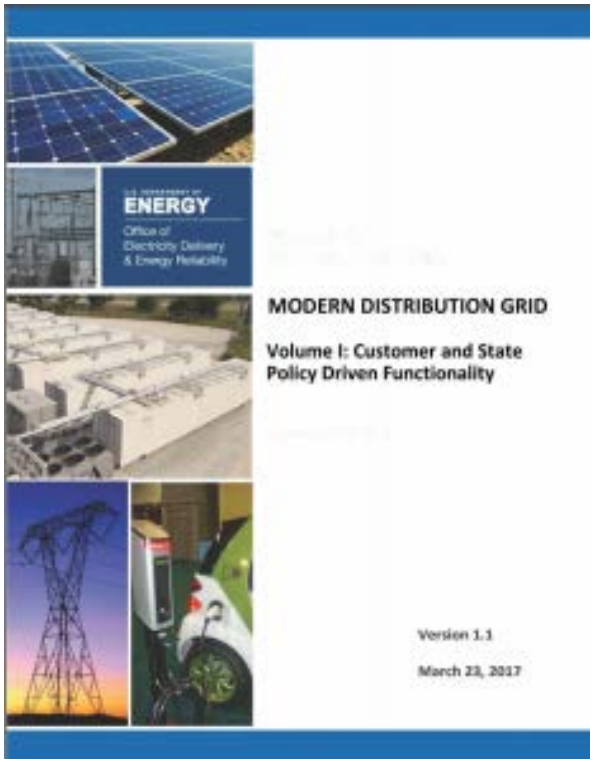
- Defines the scope for a modern grid platform using a framework approach to organize capabilities and functions
- Includes a Grid Architecture comparative assessment

**Volume II. Advanced Technology Maturity Assessment**

- Assesses gaps and availability in commercial tech needed for distribution system planning functions
- Includes technology adoption curves

**Volume III. Decision Guide for Modern Grid Implementation** *(final draft pending)*

- Provides considerations for implementing an advanced distribution grid based on state examples
- Examines coordination and communications networks, smart inverters, and DER aggregation and optimization




https://doe-dspx.org/

# Grid Architecture

**About Grid Architecture:**
Grid Architecture views the grid as a network of structures, including electrical structure, industry, regulatory, and market structure, information systems and communications, and control and coordination structures and provides the means to understand and plan their interactions. It illustrates how organized central wholesale markets are integrated with bulk system control, how distribution level changes related to penetration of Distributed Energy Resources impact both distribution and bulk systems operations, and how certain existing grid structures limit the ability to implement forward-looking changes to the grid.

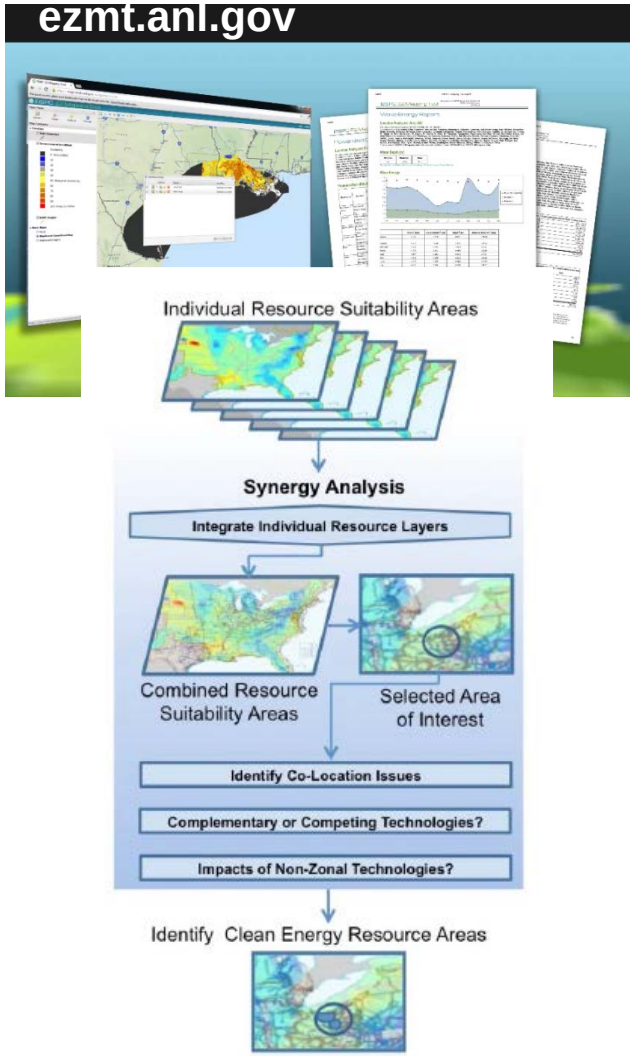
**Links to recent reports:** (other reports and presentations are available through the PNNL link below)

- **Foundational Paper (January 2015)** - http://gridarchitecture.pnnl.gov/media/white-papers/Grid%20Architecture%20%20-%20DOE%20QER.pdf
- **Grid Architecture 2 (January 2016)** - http://gridarchitecture.pnnl.gov/media/white-papers/GridArchitecture2final.pdf

**PNNL Grid Architecture Website:**

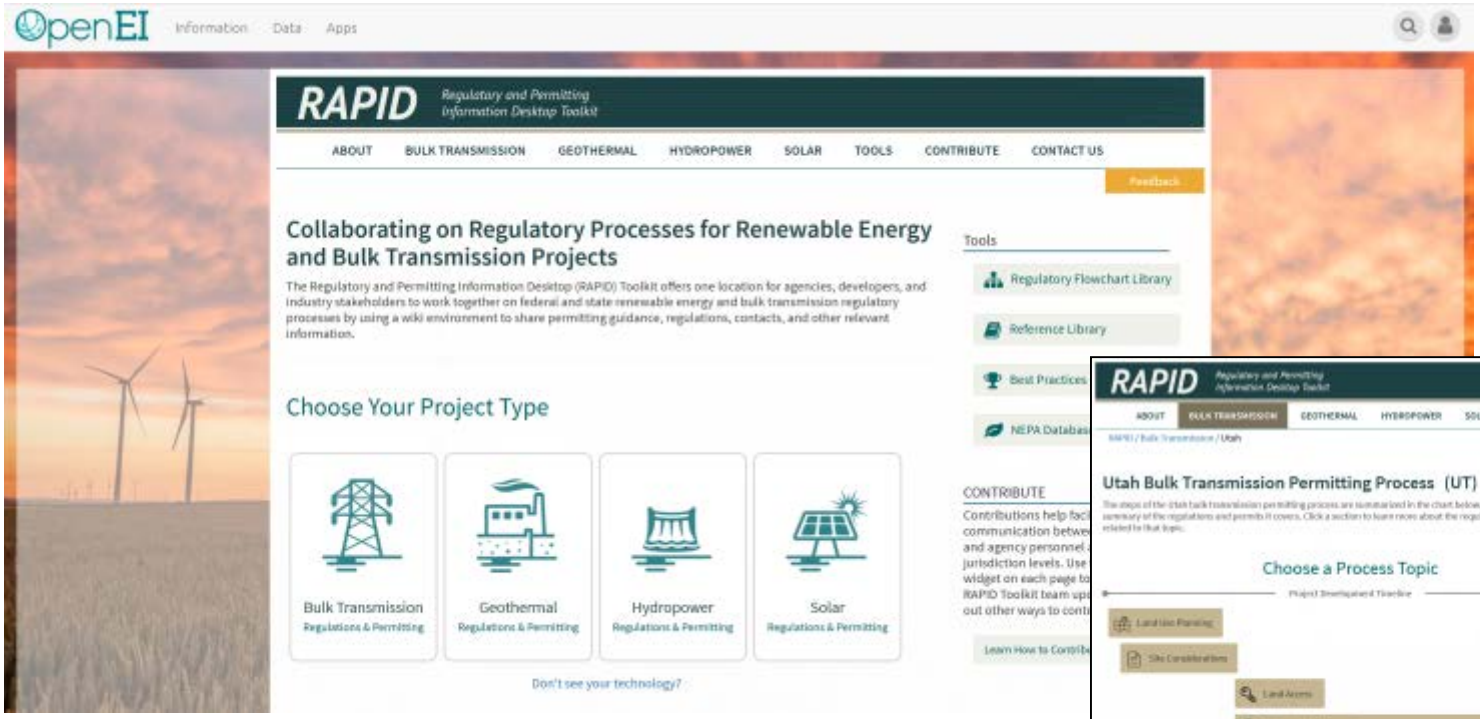
- http://gridarchitecture.pnnl.gov/

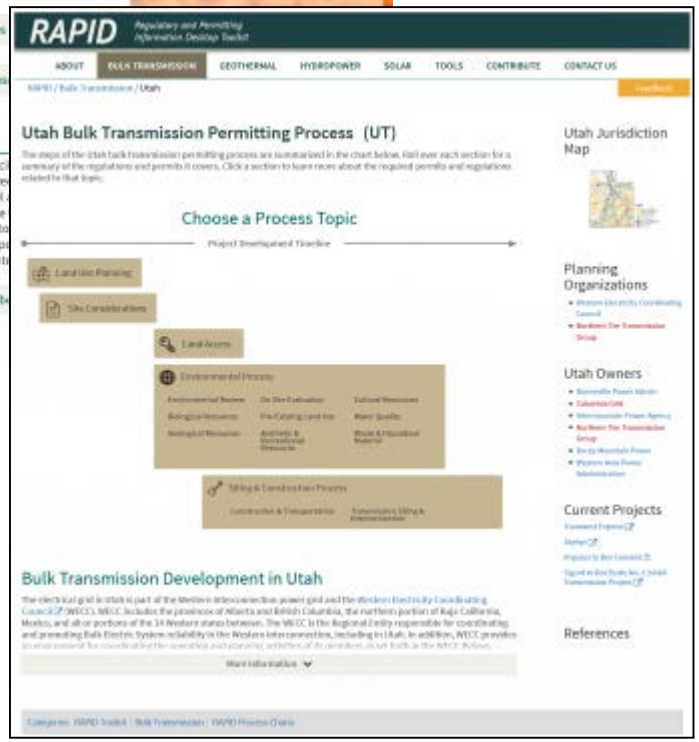
# Energy Zones Mapping Tool




- Web-based EZ Mapping tool looks at 9 clean energy resource for development
  - ~1100 registered users
- Developed by ANL
  - Evaluation of potential transmission facility locations in sensitive areas or resource-constrained areas
  - 368 Corridor Study
- Produces user-customized maps of areas that fit the screening factors and criteria for various electrical power generation technologies
- ANL continues its stakeholder outreach campaign and technical assistance for the EZ Mapping Tool
  - New data layers added as needed/requested (FY14 - national trails, energy-water)

# RAPID Toolkit




http://en.openei.org/wiki/RAPID

- Permitting Topic
- Jurisdiction
- Federal & State Agencies

# RAPID: Three Ways to Navigate

## Topic

- Agency Land Use Planning
- Cite Considerations
- Land Access
- Construction and Transportation Permits
- Facility Licensing, Certification, Safety and Regulation
- Transmission
- Environmental
- Water Access/Rights
- Facility Decommissioning

## Jurisdiction


## Federal Agency

- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- FERC
- US Forest Service
- National Park Service
- Department of Energy
- Rural Utilities Service
- Federal Highway Administration
- Federal Aviation Administration
- And more…

# RAPID Contacts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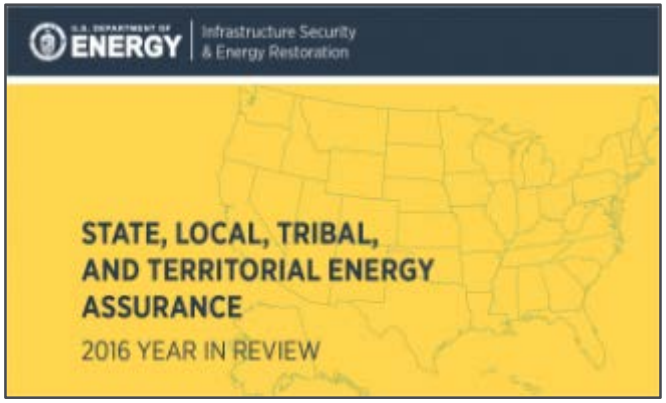
**303-275-3855**

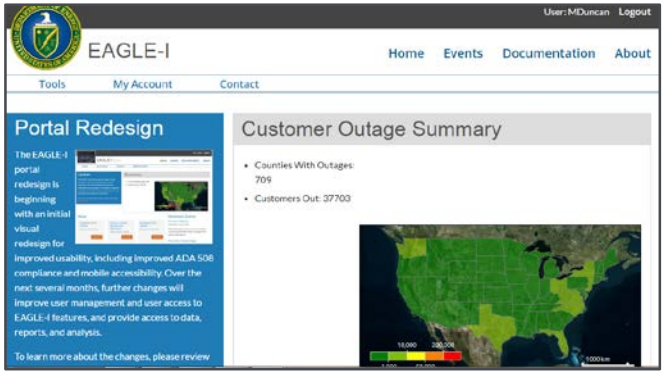
# Office of Electricity
## Infrastructure Security & Energy Restoration

https://energy.gov/oe/mission/infrastructure-security-and-energy-restoration-iser

# Energy Assurance Activities in FY 17 – DOE HQ

- **SLTT Energy Assurance 2016 Year in Review**
  https://energy.gov/oe/articles/state-local-tribal-and-territorial-energy-assurance-2016-year-review
- **Energy Assurance Joint Policy Committee**
  - Comprised of Energy Officials, Emergency Managers, & Regulators – April 5, 2017
- **Next Generation of EAGLE-I**
  - Full access for states
  - https://eagle-i.doe.gov/login
- **Energy Waiver Library on Energy.gov**
  - https://energy.gov/oe/energy-waiver-libraryHurricane Season 2017
- **UPDATE EEAC INFO**
  - http://naseo.org/eeac




# Energy Assurance Activities with the N-Groups

- **Energy Assurance Plan Updates w/ NASEO**
  - ✓ 12 states in process of updating plans
  - ✓ NASEO updating guidelines/provide technical assistance
- **Cybersecurity Training w/ NARUC**
  - ✓ Cybersecurity Primer for Regulators 3.0 – Jan 2017
  - ✓ Cybersecurity Primer regional training – Summer ‘17
- **Resilience Assessment/ Exec Orders w/ NGA**
  - ✓ Develop state resilience assessment tool for states
  - ✓ Develop executive order roadmap
- **Protect Critical Infrastructure Information and Tribal Engagement w/ NCSL**
  - ✓ Develop best practices for critical infrastructure information protections in legislation
  - ✓ Reengage tribal state energy assurance work

# Energy Assurance Contact

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# DOE
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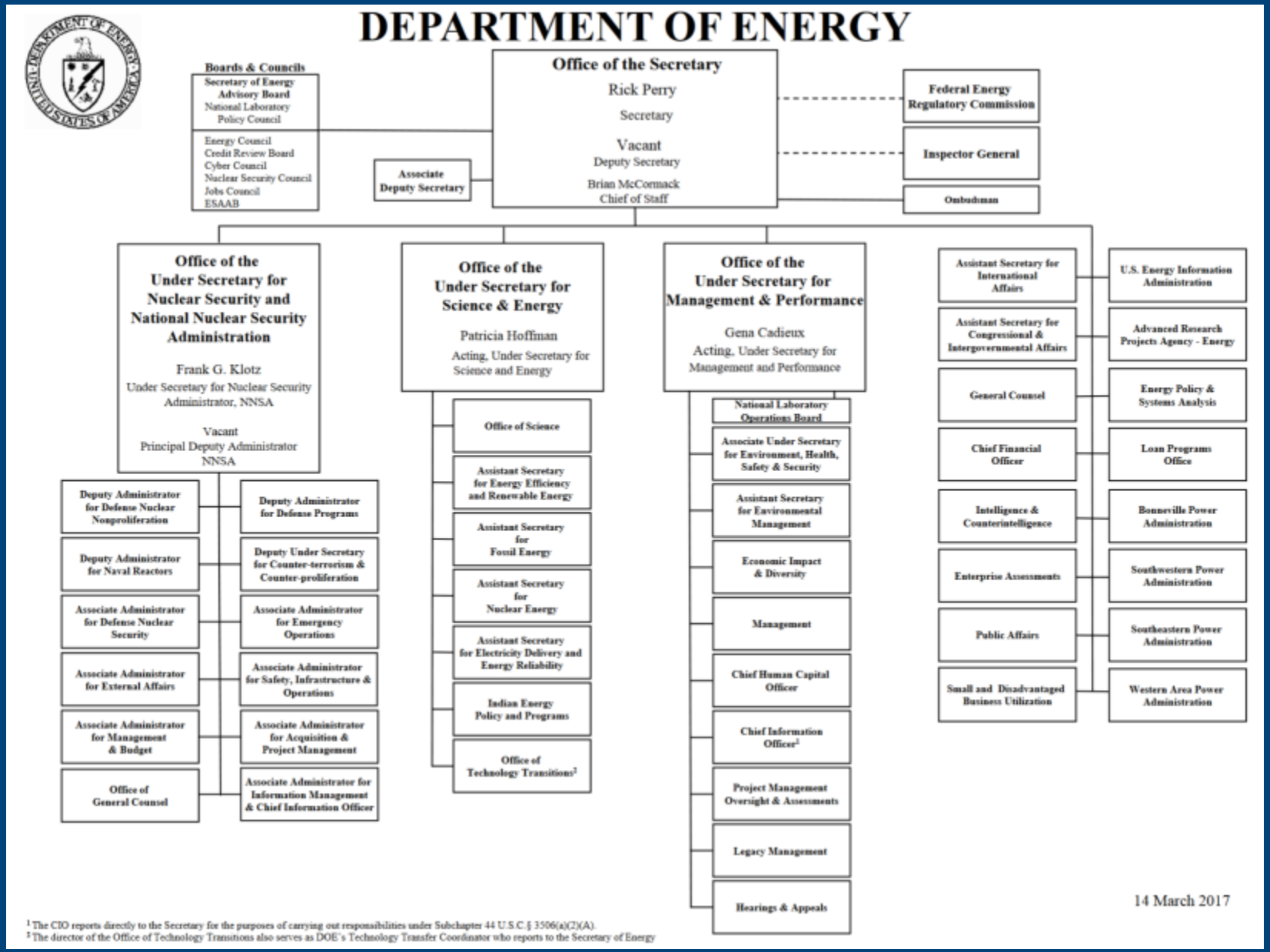


**http://energy.gov/leadership/organization-chart**